

ADAPTIVE MODULATION FOR MULTI-ANTENNA TRANSMISSIONS WITH PARTIAL CHANNEL KNOWLEDGE

ABSTRACT

Adaptive modulation techniques for multi-antenna transmissions with partial channel knowledge are described. Initially, a transmitter is described that includes a two-dimensional beamformer where coded data streams are power loaded and transmitted along two orthogonal basis beams. The transmitter optimally adjusts the basis beams, the power allocation between two beams, and the signal constellation. A partial CSI model for orthogonal frequency division multiplexed (OFDM) transmissions over multi-input multi-output (MIMO) frequency selective fading channels is then described. In particular, an adaptive MIMO-OFDM transmitter is described in which the adaptive two-dimensional coder-beamformer is applied on each OFDM subcarrier, along with an adaptive power and bit loading scheme across the OFDM subcarriers.